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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/766,161	01/19/2001	Michael S. Colman	MCA-538	9144

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EXAMINER

MENON, KRISHNAN S

ART UNIT

PAPER NUMBER

1723

DATE MAILED: 06/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/766,161

Applicant(s)

COLMAN, MICHAEL S.

Examiner

Krishnan S Menon

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/20/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) I
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 ✓
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "selective" in claims 1-13 is a relative term which renders the claim indefinite. The term "selective" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The invention pertains to improving the recovery of nucleic acid fragments from impurities and other reagents, and the improvement consisting of increased recovery of smaller PCR products and DNA fragments brought about by dilution of the sample, concentration of the sample and by application of two different pressures. However the invention does not specify anything being "selectively" recovered.

For examination purposes, the examiner of record has defined nucleic acid as the material being removed 'selectively' from impurities.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Bussey (US 6,011,148)

Claim 1: Bussey teaches selective recovery of nucleic acids from liquids (solutions) (abstract and lines 55-67, col 2); diluting the sample (lines 10-24, col4); and use of ultrafiltration membrane (lines 45-54, col 4).

Claim 2: The dilution is encompassed (lines 10-24, col 4) of Bussey's teachings of diafiltration and continuous diafiltration.

Claim 3: Bussey teaches the diluents water, EDTA , Tris-HCl, and their mixtures (lines 5-20 of col 10, and lines 45-55 of col 11.)

Claim 4: Teaches separating the double stranded DNA or RNA (col 3, lines 24-32), when he states that the concentration of the single stranded DNA is less than 1%.

Claim 5: the pressure differential (trans-membrane pressure) is constant (Lines 28-32, col. 7)

Claim 6, 7 and 8: In addition to the selective recovery of nucleic acids with ultrafiltration membranes at constant pressure differential (see above), the pressures 25" Hg and 10" Hg fall within the range taught by Bussey.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 9-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Bussey (148) in view of Simon (us 5,434,048).

Bussey (148) discloses a process for selective removal of contaminants by adding to said sample monovalent cations (col 10, lines 5-20) and contacting said sample with an ultrafiltration membrane and subjecting a pressure differential to the sample. The primary reference fails to disclose the use of condensing agents like bivalent cations as recited by claims 9 and 10. Simon (048) teaches the use of monovalent and bivalent cations, i.e., KCl and MgCl₂ (col 5, lines 28-34) for removal of contaminants by centrifugal ultrafiltration (col 3 lines 14-17). It would have been obvious to one ordinarily skilled in the art at the time of invention to use Simon's teachings of using bivalent cations with Bussey's teachings of removal of contaminants from the sample using an ultrafiltration membrane under a pressure differential.

One ordinarily skilled in the art at the time of this invention would chose Simon's method for the separation of the contaminants by adding the monovalent and bivalent cations and then contacting the sample with an ultrafiltration membrane under a differential pressure as taught by Bussey, instead of the centrifugal ultrafiltration by Simon. It would be obvious to one of ordinary skill in the art at the time of the invention to substitute ultrafiltration by differential pressure in place of centrifugal ultrafiltration, a similar process performing a similar action.

Claims 10 -12: Bussey (148) discloses a process for the selective removal of contaminants by adding to said sample monovalent cations, contacting the sample with an ultrafiltration membrane and subjecting the sample to a pressure differential. The primary reference fails to disclose the

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addition of bivalent condensing agents. Simon (048) teaches the bivalent cation Mg (col 5 lines 28-34) in a purification process using centrifugal ultrafiltration. It would have been obvious to one of ordinary skill in the art at the time of the invention to chose the addition of Mg as a bivalent cation condensing agent as taught by Simon with Bussey's method of ultrafiltration under a pressure differential.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bussey. While Bussey teaches all the limitations of claim 13, as explained in the forgoing paragraphs, including varying the pressure, Bussey does not specifically state the use of a first and then a second pressure. However, Bussey teaches that "Generally filtration process is faster with higher pressures, but higher pressures are likely to cause shearing of the nucleic acid or loss due to passage through the membrane" (lines 30-40, col 7). This statement proves that lower trans-membrane pressures would afford recovery of lower nucleic acid fragments. Therefore, it is obvious for one of ordinary skill in the art at the time of the invention that flow through an ultrafiltration membrane is pressure dependent and one could subject the samples to different pressures to obtain different flow rates of each species. It is also obvious to one ordinarily skilled in the art at the time of invention that filtering a second time with a different pressure would result in better recovery. Filtering with a second pressure is only a repeat process of filtering with the first pressure.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Geiger teaches the membrane process including dilution, many of the diluents, and

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selective removal using condensing agents. Wijnendaele also teaches ultrafiltration for purifying proteins including nucleic acids, use of divalent cations and other additives..

Any inquiry concerning this communication or earlier communications from the examiner on this application should be directed to Krishnan S. Menon, phone number (703) 305-5999. The examiner can be reached normally on Mondays-Thursdays and alternate Fridays between 8:30 AM and 4:45 PM. In case the examiner is not available, the supervisory patent examiner, Ms. Wanda Walker, may be reached at (703) 308-0457.

The general fax number of this art unit is (703) 872-9310, and (703) 872-9311 after final rejection. When filing a FAX in Tech Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the application file. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 308-0661.

Krishnan S. Menon
Patent Examiner
Art Unit 1723

KSM
May 31, 2002


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